MINISTRY OF WATER AND IRRIGATION

Water Resource Policy Support

Information Management

Migration of Water Quality Data from WAJ and RSS to MWI WIS

(supplementary section to the June, 2001, report)

by Howard Wong

August, 2001

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EXECUTIVE SUMMARY

This study is a continuation of the original efforts to migrate water quality data to MWI from the collaborative organizations carried out by the Consultant from 1 May to 4 June 2001. The recommendations on ways to facilitate the transfer of water quality data from the WAJ LABS and RSS to MWI made in the June report, including assessment of historical data held by WAJ LABS, were used as the tasks requirements for this study under the project component: water reuse monitoring and information management.

One of the objectives, assessment of the historic data, indicates there are two distinct data sets held by WAJ LABS as shown below.

1989– 1995	archived onto floppies using an old LIMS archive utility. Not currently accessible due to corruption of original software.
1995 –present	LOIS system under FoxPro running to present day

There were three alternative options presented to allow WAJ LABS to utilize the historic data: either integrating it partially into the SQL LIMS; or fully into the SQL LIMS; or collating the data for presentation and visualization outside of SQL LIMS as a separate utility program. The costs of these options vary from $US 10,000 to $US 60,000.

It was expected that WAJ LABS would be able to transfer their water quality data sets from SQL LIMS to MWI WIS database system as both run under Oracle. To date, SQL LIMS is not fully operational and as an interim measure the current data held by WAJ Labs and RSS are expected to be downloaded as spreadsheet files to enable data transfer between database systems.

Another objective was to conduct a case study to establish guidelines on the data migration process at WAJ LAB and RSS, using the spreadsheet proforma originally produced by Andrew Alspach (MWI/ARD, 2000c. “Monitoring and Information Management Pertaining to Water Reuse in Jordan”. Working Paper, Ministry of Water and Irrigation, Amman). However a unused utility program written in FOXPRO in 1997 was discovered at WAJ LAB in which many of the facilities for migration of water quality data to MWI have been already completed. Some modifications to the program would be required to be able to export data in the correct fields according to MWI specifications.

The RSS to date has not yet been able to complete the proforma spreadsheet and this is expected sometime after the completion of the Consultant’s input. MWI staff should review the completed proforma and use it as a guide to setting up a clear and concise formalization procedure to migrate water quality data from collaborative organizations to MWI WIS.

The most crucial element in the migration of data to MWI from the collaborative organisations is a clear and concise formalization procedure outlining in detail the full requirements of the data migration process. These requirements must be understood by

not only the management staff but the personnel allocated to the tasks, otherwise the migration process will not function efficiently. This will affect the overall validity and quality of the data held in MWI WIS.

The conclusions from this study are described below.

- Initial assessment of historic water quality data held in WAJ LABS indicates that the old LIMS data (1989-1995) can be recovered by the supplier, LABWORKS. This data can be collated with the FOXPRO data and, depending upon the available budget, one of 3 options may be used to combine the SQL LIMS data for a continuous long term record for analysis, projection and visualization for strategic decision making at MWI.

- The process of data migration must be formalized to maximize the efficiency, validity and overall reliability of the data from the collaborative organization to MWI WIS. All personnel involved with this process must be kept fully informed as to agreed formats, standards, and codes to minimize confusion and loss of productive time.

- The existing utility program for data migration from WAJ LABS to MWI WIS should be modified to incorporate current specifications as required by MWI. With the completion of the spreadsheet proforma by RSS, this will give the background and experience needed to produce clear and concise requirements for the formalisation of the data migration process between MWI and collaborative organisations

CONTENTS

List of Abbreviations

AZB	Amman-Zarqa Basin
MEQ/L	milliequivalents per litre
MG/L	milligrams per litre
MWI	Ministry of Water and Irrigation
RSS	Royal Scientific Society Water Quality Laboratory
SQL LIMS	Laboratory Information Management System, Applied Biosystems
WAJ	Water Authority of Jordan
WIS	Water Information System

1 INTRODUCTION

1.1 Objectives

The key objectives of this study have been based on the recommendations from the previous study completed by the Consultant from 1 May to 4 June 2001 to support the data migration process and information management between the corroborative organisations and MWI. These objectives are as follows:

- assess the historic data held in electronic form by WAJ Labs and the feasibility for migration into SQL LIMS and MWI WIS or alternative options.

- conduct a case study to determine the gaps in the data migration procedures from WAJ to MWI. Using the results of the case study to develop and define methods to formalise the procedures for data migration in electronic form.

- Continue development of a spreadsheet template to allow migration of data from all collaborative organisations.

1.2 Formalisation of the Data Migration Procedure

The key to the whole data migration process is dependent upon formalisation of the inter-institutional information flow network (ARD/USAID 2000).

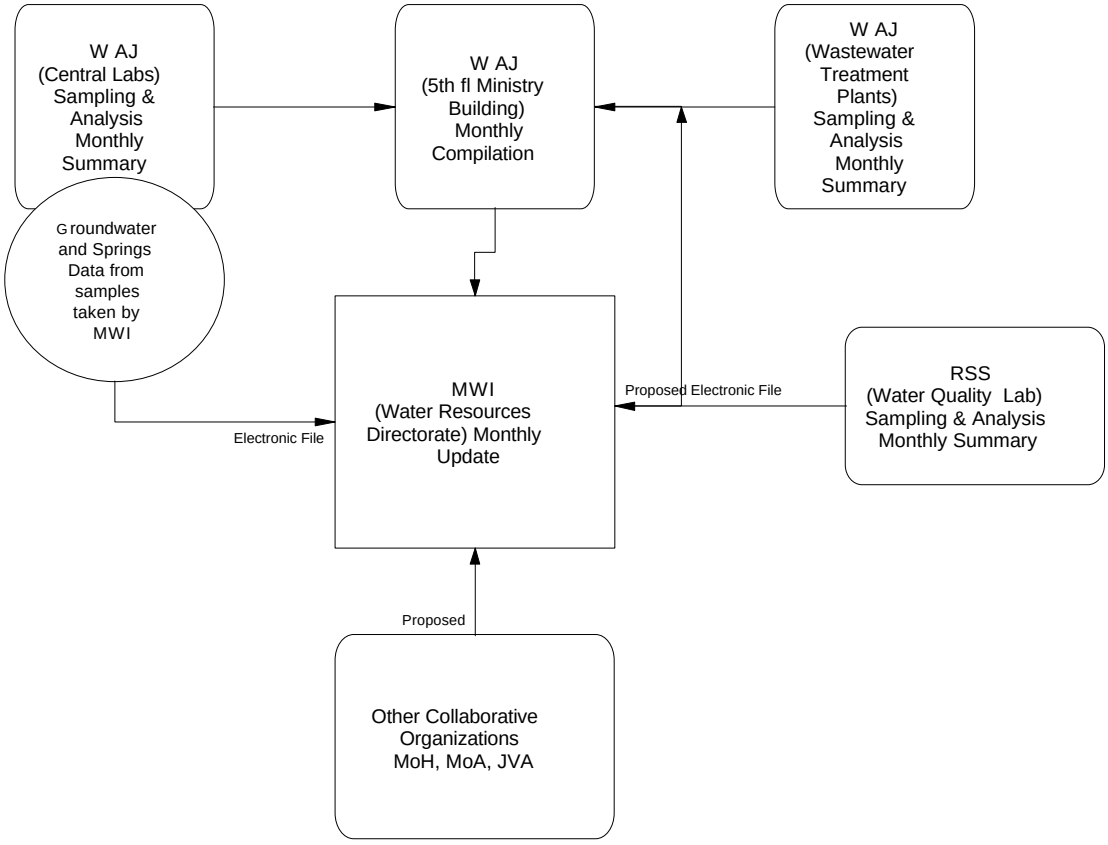
> *Water quality data is collected by organizations under the umbrella of MWI and in some cases by hired contractors such as RSS. Currently this data is socialized through informal channels in formats that do not facilitate easy updates to the MWI central database (WIS). Potential steps to formalize information flow between MWI and collaborative organizations include, assessing the inter-institutional flow networks, installing hardware and software for data entry, developing strategies for data compatibility with MWI database and developing lines of information transfer between organizations.*

Formalisation procedures to ensure efficient information flow between MWI and the collaborative organisations are dependent upon line managers, their understanding of the technical issues surrounding data migration and ability to work effectively with the end users.

Installation of hardware and software including standard entry forms have been largely completed. Some water quality information has been migrated to SQL LIMS principally samples of groundwater and springs taken by the MWI monitoring unit.

It is envisaged that the case study to be conducted at WAJ LABS and RSS will be used to produce a flexible data transfer proforma using spreadsheet files to provide the necessary linkages between water quality data held by the collaborative organizations and migration of this data to the MWI WIS. This proforma will provide sufficient detail to capture the pertinent water quality data, assign appropriate MWI codes and allow enough flexibility to be used in a number of organisations. Figure 1 shows the potential inter-institutional information flow network for water quality data.

Figure 1 Potential Data Migration of Water Quality Data to MWI



Modified after Alspach (2000) Internal Draft-For Discussion for the Monitoring & Information Management Pertaining to Water Reuse in Jordan, MWI, Amman Jordan.

2. ASSESSMENT OF HISTORIC DATA HELD BY WAJ LABS

The objective this component of the study is to assess the feasibility and requirements to migrate the historic data held by WAJ LABS into the SQL LIMS.

The historic water quality data can be separated into two distinct data sets. One set that was original held in the old LIMS database from 1989 to 1995 and archived onto floppy

disks. The more recent data from 1995 to present is compiled in the FOXPRO version 6 (LOIS) and it is currently used as the data management system for WAJ LABS.

Due to the corruption of the old LIMS software from LABWORKS the historic data (1989-1995) can not be retrieved. There has been correspondence with LABWORKS, shown in Appendix 3, and the current status is that LABWORKS will be able to recover the data and export it in a suitable format for WAJ LABS. The cost of this is subject to the amount of data and LABWORKS suggest that estimates of time and cost would be dependent upon sending the floppy disks containing the archived data to them for evaluation.

Even if LABWORKS can recover this data it would require a process of validation before consideration can be given for migration to SQL LIMS. In addition the structure of SQL LIMS is much more rigid in respect to verification of sample parameters such as laboratory and location ID therefore this historic data may not contain all the required data sets for import directly to SQL LIMS. Further assessment of this historic data would be required to determine the benefit both in terms of its intrinsic worth (reliability and validity), budget and overall practicality.

In respect to the data held in FOXPRO (LOIS) the recent data at least has gone through a validation procedure and the data may be easily exported to any standard format.

2.1. Options for Migration

Assessment of the mechanisms to migrate and collate the historic data to SQL LIMS or alternative options are listed below.

The SQL LIMS specialist, Stefaan Kerfat explained in recent correspondence that when migrating the data to SQL LIMS there are two options available:

1. Migrate the data into the SQL*LIMS database schema. This means inserting the data in the existing SQL*LIMS tables. The forms can be used to view query and browse data. This is more time consuming because a real mapping of fields from the old system should be done against fields in the SQL*LIMS system.

   This time consuming migration would require specialist personnel and tools.

2. Create additional tables in the SQL*LIMS database that hold the historic data. firstly extract the data from the existing system and import them in the same data structure in the new system. This will provide limited visibility of the data through the SQL*LIMS forms. You can define some reports to review the historic data, but the data will not be accessible from the SQL*LIMS forms. Basically the only way to view and analyze data is to run reports against it.

After discussions with Dr. Sunna and the freelance computer consultant, Hala Zuwati a third option was presented.

3. A programme is written to collate historic data LIMS from LABWORKS, FOXPRO data and SQL LIMS data as an export utility program. This program would essentially query the appropriate data structure in each system and collate the information in as a database (dbf) or spreadsheet file (xls). This data can easily be analysed and presented in graphical form using EXCEL OR SPSS.

2.2. Estimates of Cost

Correspondence was sent to the suppliers of the software to obtain an estimate of costs for completion of each of the options and recovery of the historic data from 1989-1995 but to date the vendors have not replied with a breakdown of costs.

The budget figures shown below have been estimated from similar type of work conducted by the Consultant but unsupported by the vendors therefore these budget costs should be used only as guidelines for the data recovery and migration.

Data Recovery	budget cost for recovery of the data (1989-1995) would be in the region of $US 3,000 – 10,000
Option 1	Initial estimate of budget cost for option 1 with the requirement of a SQL LIMS expert for up to 1-2 months, local staff and tools will be in the range of $US 30,000 – 60,000.
Option 2	This will be less time intensive for the SQL LIMS expert and a large part of the work may be completed by local staff. Budget cost in region of $US 15,000 – 30,000
Option 3	Majority of this work can be completed by local staff with a relatively small input for the SQL LIMS expert. Budget cost about $US 10,000 – 20,000

3. WATER QUALITY DATA MIGRATION

3.1. Current Status

There is a sizeable pool of water quality information held by collaborative organizations however to date migration of data to MWI WIS consist only of the analysis by WAJ LABS of spring and groundwater samples taken by the MWI monitoring unit.

3.2. Case Study

3.3. Spreadsheet Template

The original spreadsheet proforma for data migration produced by Andrew Alspach (USAID/ARD Nov. 2000) was modified for this study. For the purposes of compatibility of water quality data for migration to WIS it should be the responsibility of MWI as part of the formalisation procedure to provide the key requirements from those already established in the WIS Oracle database system in terms of lists of sample IDs, parameter coding and concentration units. Other codes such as analytical methods, sample media codes and quality remarks should be completed by the respective laboratory.

The spreadsheet proforma is shown in Appendix 4 and modifications includes the following:

- Instruction sheet on how to fill in each of the data sheets. Note that the current requirements of major ions from MWI are in MG/L
- MWI Parameter Code (full list of about 700 parameters)
- Analytical method – note that this list is representative of common name of the analysis or the main equipment used in the procedure and not a detailed reference to a methodology.
- Quality Remarks – this list was originated from WQIC project, USAID/DAI (1998)

The spreadsheet proforma file is provided on floppy disk

3.3.1. WAJ LABS

In the process of the accessing the historic data it was discovered that a utility program was written in 1997 in FOXPRO by the free lance consultant, Hala Zuwati to transfer data from WAJ LABS to MWI WIS in an agreed format. Due to lack of usage this program was forgotten until now. Screen dumps of various menu screens are shown in Appendix 3. Review of the program shows that data from FOXPRO (LOIS) can be queried and exported as database format (dbf) in two ways according to the menu options.

Menu 1 Transfer Chemical Analysis Data to MWI/WIS Format

Search of water quality data according to sample ID or range of dates or both according to a standard list of physical and chemical parameters formalised between MWI and WAJ LABS for groundwater and springs shown in the table below.

Table 1 MWI Parameter and Concentration Units from 1997

PARAMETER	CONCENTRATION UNITS
pH	unitless
Electrical Conductivity	µs/cm
Calcium (Ca)	MEQ/L
Magnesium (Mg)	
Potassium (K)	
Sodium (Na)	
Sulphate (SO_4)	
Chloride (Cl)	
Carbonate (CO_3)	As MEQ/L CO_3
Bicarbonate (HCO_3)	As MEQ/L HCO_3
Nitrate (NO_3)	As MG/L NO_3

Note: these parameters and concentration units on applied to groundwater and spring samples taken by MWI monitoring unit and the list of parameters and concentration units agreed with MWI

Menu 2 Selecting and Listing Records

This menu can be queries according to MWI sample ID, collection date and analysis/paramter code. This allows flexibility for the end user to export data and vary the sample ID in respect to dates and the list of parameters. However the concentration unit can only be expressed as MEQ/L.

The main drawback with this program is that due to the changing requirements by MWI for data migration to WIS it is important that this program should be more flexible. The spreadsheet proforma is not needed if the current utility program can be modified according to the specifications required by MWI. The WAJ LAB does not have an in-house programmer to modify this utility as the original utility was compiled by the computer consultant, Hala Zuwati. It would be most cost effective to utilise her services for further modification to the utility programme.

Modifications to the program to include:

- New monitoring stations (Sample ID) must be identified to the WAJ LAB by the monitoring department in MWI to be included in the database system.

- Change the parameter code and concentration units requirements or include additional parameters

- Addition of fields for general analytical methods, quality remarks

3.3.2. Royal Scientific Society (RSS)

The spreadsheet proforma was sent to Dr. Saidam, Head of Water Resources Studies Division, Environmental research Center, and a request for typical analytical data from each of the monitoring sites contracted for WAJ and if appropriate JVA. Appendix 4 shows the principle sheets within the spreadsheet proforma file "Water Quality Migration Template 1.xls". The input of the data into the proforma should use the guidelines shown in the "INSTRUCTION" sheet.

Unfortunately to date the proforma has not been completed due to time restrictions by the RSS. Submission of the completed proforma is expected in the first week of August 2001 however this will be after the completion of the Consultant's input. It is suggested that MWI staff review this information to assist and guide in the production of the overall formalisation procedure for data migration from collaborative organisations to MWI WIS.

4. CONCLUSIONS & RECOMMENDATIONS

The most crucial element to the migration of data to MWI from the collaborative organisations is a clear and concise formalization procedure outlining in detail the full requirements of the data migration process. These requirements must be understood by not only the management staff but the personnel allocated to the tasks otherwise the migration process will not function efficiently. This will affect the overall validity and quality of the data held in MWI WIS.

In the formalisation process the responsibility of MWI based on the fields already set-up in WIS should include the following:

- All standard coding for parameters, methods, quality remarks
- unique station ID for each monitoring station and
- the selection of the water quality parameter with the appropriate concentration unit.

It is the responsibly of the laboratory to assure the validation and accuracy of the water quality data sets and to match the data with the correct MWI station ID and sample data. In addition the laboratory should be responsible to fill in the method analysis, equipment and analytical methods codes according to MWI standard coding.

The conclusion from this study is described below.

- Initial assessment of historic water quality data held in WAJ LABS is indicates that the old LIMS data (1989-1995) can be recovered by the supplier, LABWORKS. This data can be collated with the FOXPRO data and depending upon the available budget one of 3 options may be used to combine the SQL

LIMS data for a continuous long term record for analysis, projection and visualization for strategic decision making at MWI.

- The process of data migration must be formalize to maximize the efficiency, validity and overall reliability of the data from the collaborative organization to MWI WIS. All personnel involved with this process must be kept fully informed as to agreed formats, standards, and codes to minimize confusion and loss of productive time.

- The existing utility program for data migration from WAJ LABS to MWI WIS should be modified to incorporate current specifications as required by MWI. With the completion of the spreadsheet proforma by RSS they will give the background and experience needed to produce clear and concise requirements for the formalisation of the data migration process between MWI and the collaborative organisations

APPENDIX 1

REFERENCES

REFERENCES

Eaton A., Clesceri L., and Greenberg A., eds., (2000) Standard Methods for the Examination of Water and Wastewater, 20th edition American Public Health Association, Washington DC

EU (2001). Regional Data Bank Phase 3, second progress report, Database enhancement in Jordan

USAID/ARD (2000) Internal Draft-For Discussion (Nov 2000) for the Monitoring & Information Management Pertaining to Water Reuse in Jordan, MWI, Amman Jordan.

USAID/SAIC (1999). Water Quality Conservation and Improvement Project, MWI, Amman Jordan.

USAID/DAI (1998) Water Quality Improvement and Conservation Project, Water Information System (WIS) Databases User's Guide, Volume II, MWI, Amman.

USAID/DAI (1998) Water Quality Improvement and Conservation Project, Water Information System (WIS) Databases Design Update Document, MWI, Amman.

APPENDIX 2

SCOPE OF WORK
CHEMIST / DATABASE SPECIALIST

Jordan Water Resource Policy Support Project
Scope of work for international short-term technical assistance
Position: Chemist / Database Specialist SOW 0306
03jun01

Background

At the conclusion of the Consultant's review of the data migration process recommendations were made on ways to facilitate the transfer of data from the WAJ Labs and RSS to MWI. Originally it was expected that WAJ would be able to transfer their data sets using LIMS as both databases uses Oracle. However LIMS is not fully operational and as an interim measure current data held by WAJ Labs and RSS will be downloaded onto excel files as the means for data transfer between database systems. These files can be easily used by all the collaborative organizations and provides a simple means for verification by using formulas for built-in error checking both in terms of errors made in the actual values put into the excel sheets to analysis error estimates using ionic balance.

The intent of this Consultant's input is to continue the efforts to migrate water quality data to the Ministry's database. The Consultant is familiar with LIMS and Oracle database as well as Standard Methods of analysis for water quality parameters.

Scope of Work

The Consultant will setup a case study for the transfer of water quality data for the WAJ Labs for water quality data from samples sent in by the MWI monitoring unit. The results of the case study will be the basis for the evaluation and assessment of data transfer of all the pertinent data sets from WAJ and RSS Laboratories using excel templates. An important part of this work will include an assessment of the viability of transferring the historic water quality data held by WAJ (1989 –2001) onto LIMS and eventually to MWI, including identifying the best options for migration of historic data to Oracle.

The activity specifically requires the following:

- Setup case study to implement the procedures needed for data transfer using excel templates from WAJ, RSS to MWI
- Assessment of the viability and validity of transferring the WAJ water quality data from 1989 to 2001 into LIMS and eventual transfer of this data to MWI.
- To provide the necessary technical linkages with the IT specialist for LIMS in respect to data structure, validation, import and export.

This work is to be integrated with the other activities under this component, and with the relevant activities of the Groundwater component.

Outputs

- Justification document for data transfer mechanism from the results of the case study
- Excel templates to transfer existing data from WAJ and RSS to MWI.
- Assessment document for transfer of historical data onto LIMS then exporting to MWI

Roles and Responsibilities

The consultant will report to ARD's Chief of Party on all logistical issues, and work directly with Dr. Nawal Sunna and MWI/ARD staff on all technical issues.

Level of Effort, and Schedule

17 days, beginning as soon as possible: 5-11jun01, and 20jul01 - 03aug01

APPENDIX 3

MEETING/DISCUSSION NOTES

KEY INFORMANTS
MEETING/DISCUSSION NOTES (June – July 2001)

29 May 01
Meeting at WAJ LABS: Dr Nowal Sunna -sunna@nets.com.jo
Samer Muqhatash (data entry and IT)

Discussions carried out on migration of old LIMS (1989-95) and FOXPRO (1995-current) data to the SQL LIMS. Originally the perception was that the LIMS in 1989 was the same that was provided by USAID in 1998. This is not the case. LIMS is a generic name for laboratory management software. Problems with security password for access to old LIMS system and corruption of software disks. There are about 150 archived disks containing backup of water quality data of old LIMS.

Dr. Sunna would like to assess the possibility of collating the water quality data from 1989-2001 at WAJ LABS into the current SQL LIMS.

Other points discussed concerning data transfer was the following:

- Request by WAJ LABS to ARD/USAID to provide a procurement budget for internet services, modem etc and PC accessories.
- Procurement of a CD writer to assist in data transfer and backup of existing files
- Highlight gaps in SQL LIMS Maintenance Contract. Since it is internet interactive access possibly include in the budget DSDN broad-banding, about 200 JD per month.

07 June 2001 @ 9:30am
Meeting WAJ LABS: Dr Nowal Sunni and Hala Zuwati (Free Lane IT consultant)

SQL LIMS manuals are on CD and copy of these were given to the Consultant to review the possibility of migration of historic data to SQL LIMS.

From Hala Zuwati:
There was an assessment of data at WAJ LABS of the historic data on the old LIMS (1989-95) carried out her as part of the EU Regional water databank project. The report was included in the last progress records.

In respect to data transfer from WAJ LABS to MWI, she has written a program in FOXPRO to automatically produce an dbf/excel file containing water quality data for samples of groundwater and springs brought to the lab from the MWI monitoring unit. This data contains the MWI station ID and the 8 major ions with concentration in meq/l except for nitrate which are in mg/l as nitrate. These parameters and concentration units were agreed by the MWI prior to compiling the program in 1997.
It appear that after the program was completed and tested WAJ LAB personnel stopped using this program. This was probably due to the fact once the IT Consultant left and over time the program became disused. Therefore by 2001 the program was

forgotten and extraction of data for migration became a tedious manual task. Hala would train both Mohamed Akkoub (IT Specialist, Programmer) and Samer Muqhatash (Data entry) to be able to run the program.

26 - 31 July, 2001
Meeting WAJ LABS: Dr Nowal Sunni and Hala Zuwati (Free Lane IT consultant)

Review of the LIM manuals on CD by the Consultant indicates no information on installing previous data onto the SQL LIMS therefore it will be important to contact the appropriate specialist from the Vendor of the software, Applied Biosystems.

The original archived data held on the 150 floppies.

Status of archived data

1989– 1995	backup onto floppies using an old LIMS archive utility
1995 –present	LOIS system under Foxpro currently running to present day

Cost of retrieval of old LIMS data ie any minimum figure discussed with the old LIMS company Can they be easily accessed and consider direct input into the new LIMS system rather than attempting to retrieve the old data.

A detail review was made of the FOXPRO water quality data migration program to compile water quality data for the groundwater and spring samples submitted by MWI monitoring unit.

For the pass two years there is a manual verification and after input into Foxpro and the data is printed out from the database and checked from the progress reports.

The original draft document proposal included an item on migration of historic data into SQL LIMS but according to Dr. Nowal the requirements were listed as an option with no estimation of time nor cost. Need to look at the LIMS contract with Applied Biosystems to check on costing of data migration. Dr. Nowal confirmed that the Consultant may contract AP directly to resolve the issues involving the data transfer mechanism and time/cost requirements to did this but AP specialists or possibly by WAJ personnel or combination of both. Dr Nowal will contact Stefaan to allow HW formal contact with AP personnel.

Contact person AP	Stephen Ferket
Email address:	ferketso@eur.appliedbiosystems.com
Company	PE Informatics

CORRESPONDENCE BY EMAIL

1. Request for time/budget requirements to migration historic data to SQL LIMS

Dear Howard,

Yes we can do this job. However to get a better understanding on how we need more information on the existing system and their requirements for the migration. In general, there are two ways to migrate data. The first is to extract the data from the existing system and import them in the same data structure in the new system. This will provide limited visibility of the data through the SQL*LIMS forms. Basically the only way to view and analyze data is to run reports against it. A more complex way is to insert the data in the existing SQL*LIMS tables, the forms can be used to view query and browse data. This is more time consuming because a real mapping of fields from the old system should be done against fields in the SQL*LIMS system. Before we can make any offers towards the customer, we need to have these two items clarified:

- Can the existing system export data
- How do you want the data to be migrated, completely towards the SQL*LIMS data model format or just as plain tables.

We can not give you an estimate on the time it'll take to migrate the data without requirements.

Best regards, Stefaan Ferket

Subj: Re: LIMS WAJ labs
Date: 26/07/2001 13:10:41 GMT Daylight Time
From: FerketSO@eur.appliedbiosystems.com (Stefaan O Ferket)
To: HowWong@aol.com

File: MeetingMinutesRequirementsw95.doc (84480 bytes)
DL Time (32000 bps): < 1 minute

Dear Howard,
I didn't receive an Email from Dr. Nawal about any migration project. The initial idea was to migrate the foxpro data to SQL*LIMS. Since this is a very time consuming requirement, we decided to drop it (See the meeting minutes attached). When migrating the data, you have two options:
1. Migrate the date into the SQL*LIMS database schema. This time consuming migration would require specialist personnel and tools.
2. Create additional tables in the SQL*LIMS database that hold the historic Foxpra data. You can define some reports to review the historic data, but the data will not be accessible from the SQL*LIMS forms.

(See attached file: Meeting Minutes Requirements w95.doc) Best regards,
Stefaan Ferket
Consultant
Applied Biosystems
Tel : +31 180 392 480
Fax : +31 180 392 489
Email : Stefaan_Ferket@eur.appliedbiosystems.com
Internet : http://www.appliedbiosystems.com/

HowWong@aol.com on 07/26/2001 12:57:08 PM

To: FerketSO@eur.appliedbiosystems.com
Subject: LIMS WAJ labs

Dear Stefaan
I trust that Dr Nowal has sent an email introducing me and the role I have with their LIMS system. Essentially I am reviewing their previous data and to estimate time, cost and the methodology in respect to importing their foxpro data into the current AP LIMS.

As I understand there was I discussions of these requirements in the Initiate proposal for your LIMS. However it is not clear the above points ie methodology, cost and time requirements also specialist personnel needed. Best regards, Howard Wong

2. REQUEST FOR COST ESTIMATE OF DATA RECOVERY OF OLD LIMS (LABWORKS)

Subj:	The old LIMS data
Date:	01/08/2001 08:58:39 GMT Daylight Time
From:	h_katkhoda@firstnet.com.jo (Husam Katkhoda)
To:	HowWong@aol.com, sunna@firstnet.com.jo

Dear HowWang and Dr. Sunna
Please find below the final e-mail I sent to Jim in the LABWORKS company which supplied the old LIMS software to the WAJ Labs and his answer regarding the cost for the transfer of the old LIMS data. (These letters are not new , they are dated in 12/2000) regards Hala

Dear Sir;
Please tell me what does it take if we send you the data on a CD to be transferred from its current format into a familiar format , such as a tabular ASCII file or into an excel sheet.. because when I tried to see the
format in which the data is saved , it seems that there are 2 ASCII files for each sample analysed, one contained the location name and the other contains the output of the analysis.

I don't think that we will do the conversion under the project I am working for , but it would be beneficial for the owner of the data to know what options do they have to retrieve the data and how much will that cost. Many thanks again with my best regards. Hala Zawati

His answer

Dear Hala

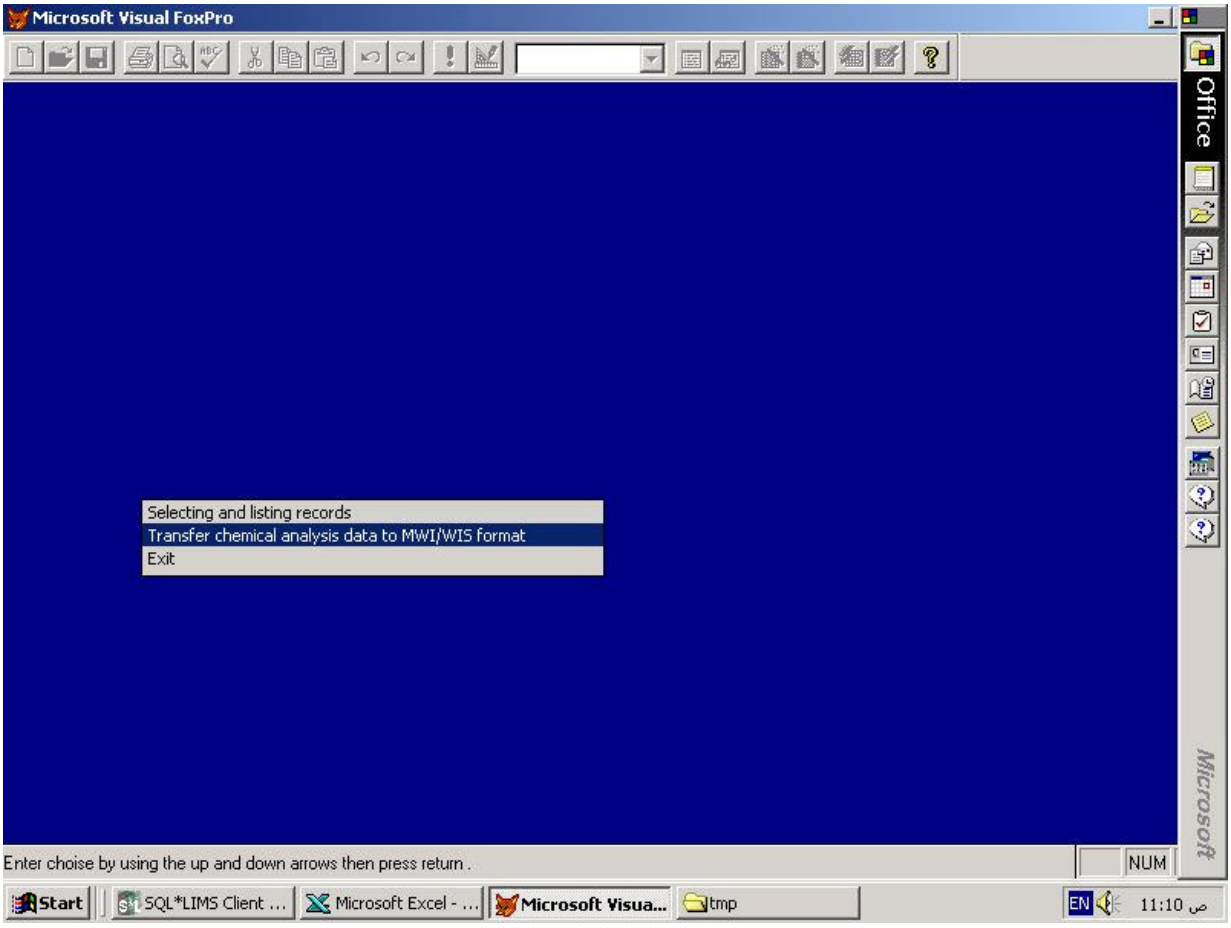
It is hard to judge the cost involved. We would need more details on volume, structure etc. We could do it. What LIMS do you now have? Jim

Meeting WAJ LABS 29 July 01
Mohamed Akkoub (IT Specialist, Programmer)
Samer Muqhatash (Data entry)

Detailed review of the program in Visual Froxpro 1997 for data migration to MWI WIS and written by Hala Zuwati for the requirements of data as requested by MWI.

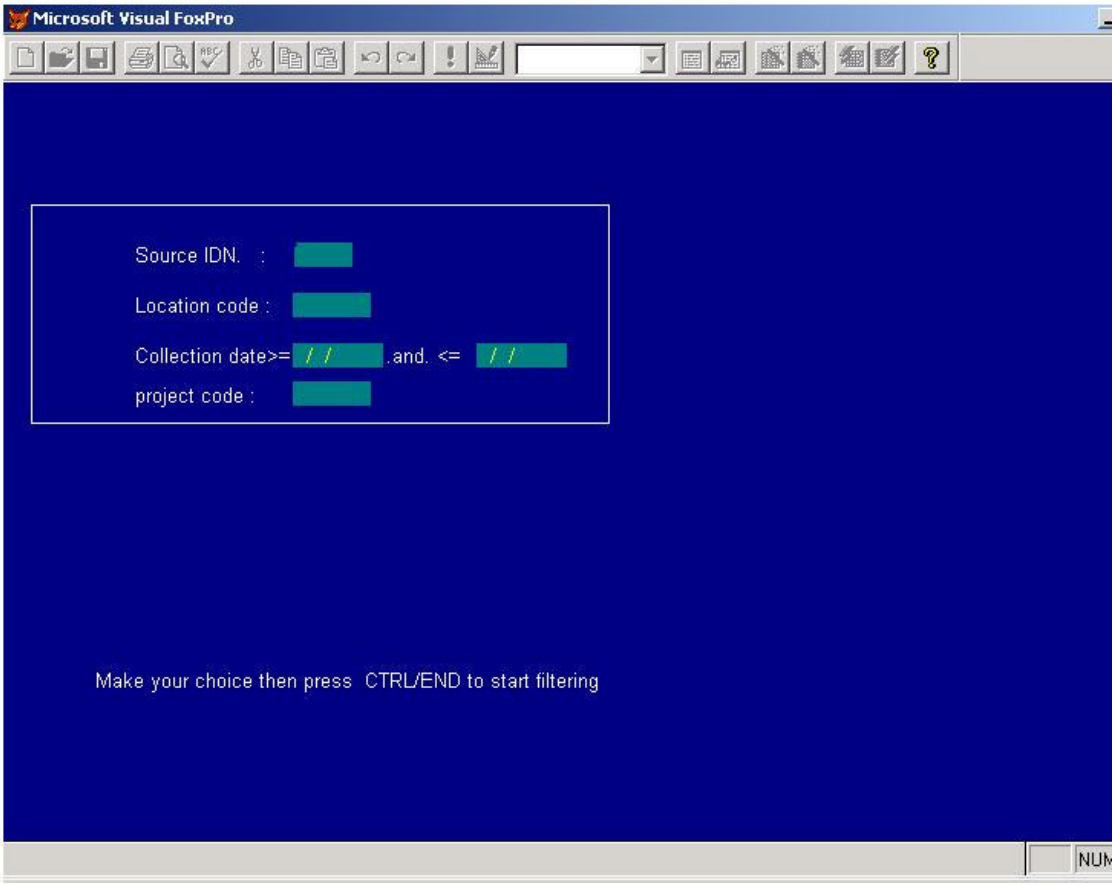
Program name in the Desktop Icon: **EXPORT V6.FXP**
PATH ON SERVER waj_labs_nt1\LOIS\exportv6.fxp

Main menu shown below
(MINISTRY OF WATER AND IRRIGATION, WATER QUALITY DATA EXPORT UTILITY)



The data is save in C:\tmp and the naming of the file relates to the date of the download of the file using the date on the computer.

The sub-menu of "Transfer chemical analysis data to MWI/WIS format is shown in the next screen dump below.



the can query according to sample ID or collection date or both. Project code relates to the organization where sample originated

UNITS IN meq/l except NO3 calculated as NO3 in mg/l

HCO3 is bicarbonate and is calculated as HCO3

In the export of data values with 0.00 implies no results either as the request for that particular analysis was not requested or the results have not been completed and inputted in the database.

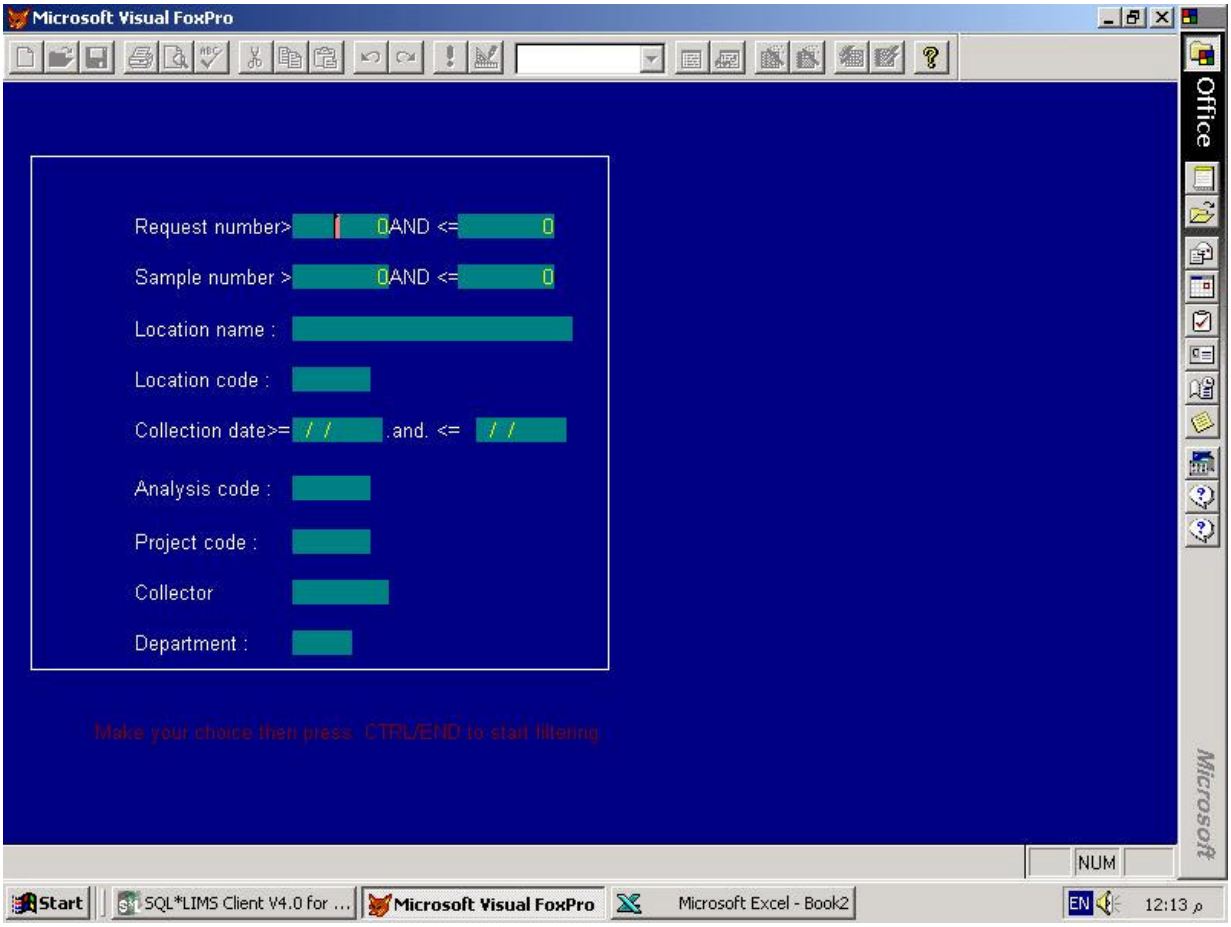
The old LIMS system was programmed in Basic and installed and running in 1989 to 1995. Input of data into Fospro (LOIS) started in May 1995

Most recent transfer of data to MWI was believe to be samples collected in May01 by MWI monitoring unit.

A variety of screen dumps were handed over to the Consultant.

The analytical codes are usually general name of the methodology and is not given the reference number as to Standard Methods eg Edition 20 2330B in FOXPRO. This reference is given in the new LIMS.

The application software for old LIMS was corrupted


Microsoft Visual FoxPro
Request number> 0 AND <= 0
Sample number > 0 AND <= 0
Location name :
Location code :
Collection date>= / / .and. <= / /
Analysis code :
Project code :
Collector
Department :
Make your choice then press CTRL/END to start filtering
NUM
Start
SQL*LIMS Client V4.0 for ...
Microsoft Visual FoxPro
Microsoft Excel - Book2
12:13
Office
Microsoft

?

31 July, 2001
Meeting MWI: Aman Jaber (Oracle Data Entry)

Reviewed the current state of the data transfer between WAJ LABS and MWI. The last water quality file of samples taken by MWI of groundwater and springs was dated 22 July 01. These consist of data from August 2000 to January 2001. The concentration units were in mg/l. This was a specific request by MWI.

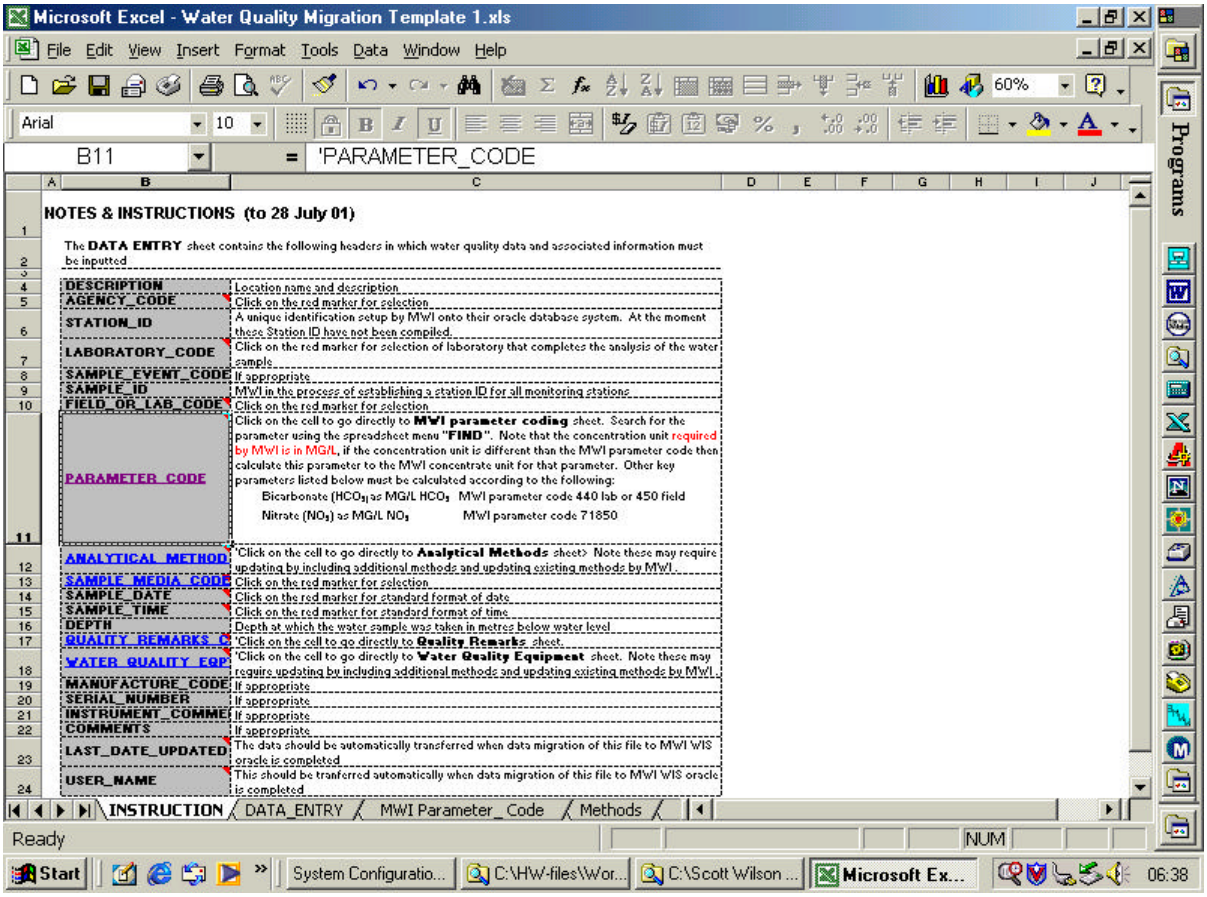
Since 1997 when the programme to collate data for migration to MWI was produced in WAJ LABS there have been additional number of groundwater and spring monitoring points. However it is uncertain whether these new sample ID were incorporated into the utility search routine. In addition the request for water quality data is different than what was originally set-up on the utility program. The main differences are the following:

All sample ID may not be included as new monitoring stations are set-up
Concentration units are different since utility program produces units in meq/l and current request by MWI is in mg/l

Addition fields are requested by MWI – chlorine, total and fecal coliform

APPENDIX 4

WATER QUALITY SPREADSHEET PROFORMA


Microsoft Excel - Water Quality Migration Template 1.xls
File Edit View Insert Format Tools Data Window Help
Arial 10
B11 = 'PARAMETER_CODE
NOTES & INSTRUCTIONS (to 28 July 01)
The DATA ENTRY sheet contains the following headers in which water quality data and associated information must be inputted
DESCRIPTION Location name and description
AGENCY_CODE Click on the red marker for selection
STATION_ID A unique identification setup by MWI onto their oracle database system. At the moment these Station ID have not been compiled.
LABORATORY_CODE Click on the red marker for selection of laboratory that completes the analysis of the water sample
SAMPLE_EVENT_CODE If appropriate
SAMPLE_ID MWI in the process of establishing a station ID for all monitoring stations
FIELD_OR_LAB_CODE Click on the red marker for selection
PARAMETER_CODE Click on the cell to go directly to MWI parameter coding sheet. Search for the parameter using the spreadsheet menu "FIND". Note that the concentration unit required by MWI is in MG/L, if the concentration unit is different than the MWI parameter code then calculate this parameter to the MWI concentrate unit for that parameter. Other key parameters listed below must be calculated according to the following:
Bicarbonate (HCO_3) as MG/L HCO_3 MWI parameter code 440 lab or 450 field
Nitrate (NO_3) as MG/L NO_3 MWI parameter code 71850
ANALYTICAL_METHOD 'Click on the cell to go directly to Analytical Methods sheet> Note these may require updating by including additional methods and updating existing methods by MWI.
SAMPLE_MEDIA_CODE Click on the red marker for selection
SAMPLE_DATE Click on the red marker for standard format of date
SAMPLE_TIME Click on the red marker for standard format of time
DEPTH Depth at which the water sample was taken in metres below water level
QUALITY_REMARKS_C 'Click on the cell to go directly to Quality Remarks sheet.
WATER_QUALITY_EQP 'Click on the cell to go directly to Water Quality Equipment sheet. Note these may require updating by including additional methods and updating existing methods by MWI.
MANUFACTURE_CODE If appropriate
SERIAL_NUMBER If appropriate
INSTRUMENT_COMME If appropriate
COMMENTS If appropriate
LAST_DATE_UPDATED The data should be automatically transferred when data migration of this file to MWI WIS oracle is completed
USER_NAME This should be tranferred automatically when data migration of this file to MWI WIS oracle is completed
INSTRUCTION DATA_ENTRY MWI Parameter_Code Methods
Ready
NUM
Start
System Configuratio...
C:\HW-files\Wor...
C:\Scott Wilson ...
Microsoft Ex...
06:38
Programs

?